



Knowledge, attitudes, and training in tobacco dependence and cessation treatment among Nursing Students in Catalonia (ECTEC Study): Cross-Sectional Study

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Keywords:	smoking, tobacco, knowledge, students, nursing, addiction
Abstract:	<p>Nursing students are part of the future health labor force and knowing their knowledge in tobacco as an addictive behavior is of importance. Particularly, nursing students who will work in mental health services should learn how to provide smoking cessation interventions, since tobacco consumption is especially high among mentally ill persons. The purpose of this study was to assess nursing students' knowledge, attitudes, and training in tobacco dependence and treatment. We conducted a cross-sectional study in 15 nursing schools in Catalonia. We employed a self-administered questionnaire that assessed students': 1) knowledge about tobacco-related issues assessed with true/false statements; 2) attitudes towards smoking assessed with a 5-points Likert scale and; 3) training received in several tobacco-related topics. Overall, 4,381 students participated. 21.1% of the responders knew how to assess smokers' nicotine dependence, and less than half knew which the effective smoking cessation therapies are. Most participants (80%) had been educated on the health risks of smoking, 50% about the reasons why people smoke and, one third on how to provide smoking cessation aid. Students in the last years of training were more likely to have received these contents (reasons: OR= 3.89; 95%CI= 3.41-4.43; provide aid: OR=7.86; 95%CI= 6.79-9.11). In conclusion, nursing students lack sufficient knowledge to treat tobacco dependence and are rarely trained in such contents. There is a need to strengthen nursing curricula in tobacco treatment, so that future nurses can address this addiction.</p>

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ABSTRACT

Nursing students are part of the future health labor force and knowing their knowledge in tobacco as an addictive behavior is of importance. Particularly, nursing students who will work in mental health services should learn how to provide smoking cessation interventions, since tobacco consumption is especially high among mentally ill persons. The purpose of this study was to assess nursing students' knowledge, attitudes, and training in tobacco dependence and treatment. We conducted a cross-sectional study in 15 nursing schools in Catalonia. We employed a self-administered questionnaire that assessed students': 1) knowledge about tobacco-related issues assessed with true/false statements; 2) attitudes towards smoking assessed with a 5-points Likert scale and; 3) training received in several tobacco-related topics. Overall, 4,381 students participated. 21.1% of the responders knew how to assess smokers' nicotine dependence, and less than half knew which the effective smoking cessation therapies are. Most participants (80%) had been educated on the health risks of smoking, 50% about the reasons why people smoke and, one third on how to provide smoking cessation aid. Students in the last years of training were more likely to have received these contents (reasons: OR= 3.89; 95%CI= 3.41-4.43; provide aid: OR=7.86; 95%CI= 6.79-9.11). In conclusion, nursing students lack sufficient knowledge to treat tobacco dependence and are rarely trained in such contents. There is a need to strengthen nursing curricula in tobacco treatment, so that future nurses can address this addiction.

Keywords: tobacco; smoking; nursing; students; knowledge; attitudes, behaviors; addiction; health promotion

BACKGROUND

Tobacco use is a significant public health hazard, responsible for nearly 6 million deaths worldwide annually (WHO, 2017). Tobacco control policies have proven to be effective in reducing tobacco-attributable morbidity and mortality (Holford *et al.*, 2014), in which treating tobacco dependence should be incorporated (Lemmens *et al.*, 2008). While progress has been made reducing smoking prevalence in the general population, prevalence remains high among people with a mental disorder (Guydish *et al.*, 2016) who smoke at rates approximately twice that of adults without mental disorder ((CDC), 2013).

The World Health Organization (WHO) has called on health professionals to be role models by not using tobacco products and promoting a tobacco-free culture (Iniciative, 2005). Nurses, as the largest group in the health care workforce, are well-placed to promote health in a variety of settings that offer opportunities for providing tobacco control interventions (Sarna *et al.*, 2009; Duaso *et al.*, 2017). However, despite the historical roots of nursing in public health and health promotion, nurses' (McAllister, 2010; Barker and Buchanan-Barker, 2011) contribution to tobacco control is insufficient (Sarna and Bialous, 2005; Duaso *et al.*, 2017) and rates of helping smokers to quit suboptimal (Rice *et al.*, 2017) even in psychiatric facilities (Metse *et al.*, 2018) where more than half of patients smoke (Ballbe *et al.*, 2016; Metse *et al.*, 2017).

Reasons for nurses' modest contribution to promoting tobacco cessation include their own tobacco use (Duaso *et al.*, 2017), lack of time in promoting healthy behaviors, and lack of training in how to support smokers to quit (Ratschen *et al.*, 2009; Katz *et al.*, 2016). International studies have shown that nurses receive little training in practical delivery of smoking cessation interventions (Warren *et al.*, 2008; Sarna *et al.*, 2012), which is one of the main factors that prevents nurses from intervening with patients who smoke (Sreeramareddy *et al.*, 2018).

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3 To deliver smoking cessation interventions effectively, nurses should be trained during their
4 professional education (Sarna *et al.*, 2006, 2014). Studies in the United Kingdom (UK) and
5 the United States of America (USA) have explored how training on tobacco use, dependence,
6 and treatment is provided in the nursing curricula (Warren *et al.*, 2009; Richards *et al.*, 2014)
7 and highlight knowledge gaps in practical contents required to deliver smoking cessation
8 services (Rigotti *et al.*, 2009).
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15 In Spain, 29% of adults (> 15 years old) are smokers (Commission, 2015), and the prevalence
16 of tobacco use among nurses (Martinez *et al.*, 2016; Duaso *et al.*, 2017) and nursing students
17 (Fernandez *et al.*, 2010; Ordas *et al.*, 2015) is similar to that in the general population of their
18 same age and sex (25.4% among nurses and 18.2 to 28.8% among nursing students).
19 However, little is known about nursing students' attitudes toward their own role in tobacco
20 control, their knowledge in a range of tobacco-related topics, and what training is received
21 on this topic during their nursing education has received scant attention in Spain. Therefore,
22 it is important to examine whether nursing students are receiving and acquiring adequate
23 knowledge and skills to deliver tobacco cessation interventions in a country in which still
24 one in four adults smoke.
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34 The aim of this study was to examine Spanish nursing students' knowledge, attitudes, and
35 training in tobacco-related issues, including dependence and treatment, during their
36 undergraduate education.
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42 **METHOD**

43 *Design and participants*

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45 The tobacco-related consumption, knowledge, and education among nursing students' study"
46 (ECTEC) is a large cross-sectional multicentre study conducted in fifteen University Nursing
47 Schools in Catalonia (Spain). The study was designed with the purpose of responding to
48 several research aims, including the characterization of tobacco, e-cigarettes, and cannabis
49 use published before (Martinez *et al.*, 2019). In brief, the participants of the ECTEC Study
50 were first to fourth-year nursing students enrolled in a nursing school in Catalonia from
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3 October 2015 to June 2016 (2015-2016 academic year). Overall, 7,660 nursing students were
4 enrolled during that time period (aggregated data provided by each university). Inclusion
5 criteria were: (1) to be ≥ 18 years old, (2) to be registered in the core subject class in which
6 the study data were collected, (3) to attend this class the day of the data collection, and (4) to
7 provide written informed consent to participate in the study.
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15 *Instrument and Variables*

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18 As part of the large ECTEC study, an anonymous self-administered paper version
19 questionnaire was designed based on the Global Health Professional Survey (GHPS) to
20 explore knowledge, attitudes and training in tobacco-related issues (Warren et al., 2011). The
21 questionnaire (available upon request) included 62 questions and was piloted in one of the
22 universities to test its reliability and acceptability (Martinez et al., 2017).
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27 For this study, the *main dependent variables* were tobacco-related knowledge, attitudes, and
28 training received in nursing school.
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31 Knowledge about tobacco-related issues referred to epidemiological data (e.g., prevalence of
32 tobacco consumption, mortality and morbidity worldwide and in Spain), health effects, and
33 tobacco dependence and treatment. Statements were formulated to assess student knowledge
34 in these areas, with response codes of "true" or "false".
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39 Attitudes towards smoking included student's opinion on whether nurses and nursing
40 students should be role models and not smoke, whether health professionals should be trained
41 to ask and record smoking status, advice smokers to quit, and help patients quit. A 5-points
42 Likert scale ("totally agree", "agree", "neither agree nor disagree", "disagree", "totally
43 disagree") was used to collect this information. For this study, the first two responses were
44 combined into "agree," and the remaining were combined as "disagree."
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50 Regarding training, participants were asked if they had received education and/or training in
51 various tobacco-related areas such as epidemiological data, health effects, morbidity, and,
52 tobacco dependence and treatment interventions. The possible response options were: "yes",
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3 "no", "do not know / do not answer". We combined "no" and "do not know / do not answer"
4 to mean "no" for this study.
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7 The *main independent variables* explored were sex, year of school (first, second, third,
8 fourth), and smoking status. Respondents were classified as current smokers (smokes either
9 daily/every day or occasionally/not every day), former smokers (used to smoke but abstinent
10 for six months or longer) and never smokers (never smoked ≥ 100 cigarettes in their life
11 (Husten, 2009).
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18 *Procedure*

19 We contacted the Deans of each Nursing School to request permission to conduct the survey,
20 and the appointment of a contact person to act as a liaison in each center. All fifteen schools
21 agreed to participate. The fieldwork consisted of several visits to each of the centers to reach
22 all the courses.
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29 In each of the selected classrooms, all students were orally informed about the main
30 objectives of the study by one of the researchers, and a participant information sheet was
31 provided. All participants gave written informed consent before completing the
32 questionnaire. Participation was voluntary and anonymous, average time to complete the
33 survey was 15 minutes, and no incentives were provided to respondents.
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40 *Data analysis*

41 For the extraction of data, all the paper-based questionnaires were digitized and processed
42 with Optical Character Recognition (OCR) and Intelligent Character Recognition (ICR)
43 Kofax[©] technology. We computed frequencies and percentages for all the dependent
44 variables. For this study, we grouped year of education in two categories 1st and 2nd year
45 students and 3rd and 4th. To test differences in independent variables (sex, year of education,
46 and smoking status) we used Chi-square tests. In addition, we performed adjusted multilevel
47 logistic regression analysis, with fixed effects, for each dependent variable to provide
48 adjusted odds ratios (aOR) and their 95% Confidence Intervals (CI) with the nursing school
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3 as the 2nd level of aggregation. Statistical significance was established at $p \leq 0.01$. The
4 analyses were performed using SPSS[®] 21.0 for Windows[®].
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10 RESULTS

11 *Participation and demographic data of the participants*

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15 The final sample was composed of 4,381 students, that represent the 57.2% of students
16 enrolled in the academic year 2015-2016 (4,381/7,660). Nevertheless, the 98.5%
17 (4,381/4,447) of students who were at class at the time of the survey agreed to participate.
18 With regard to participants' sociodemographic characteristics, 83.9% were women, 58.2%
19 were in their 1st or 2nd year of school, 29.7% were smokers, 57.2% never smokers and, 13.1%
20 former smokers.
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26 *Participants' knowledge in tobacco-related topics*

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29 Most participants (98%) responded that tobacco use is an addiction and 98.3% responded
30 that secondhand smoke is a health hazard for non-smokers. However, only 35.8% knew that
31 tobacco consumption rates were decreasing in Spain at the time of the study. Students in the
32 3rd or 4th years of training knew more of this epidemiologic trend than those in 1st or 2nd year
33 (Figure 1). About 77.5% knew that tobacco-related mortality is decreasing in Spain and
34 66.4% knew that cardiovascular diseases are the main cause of tobacco-related morbidity. In
35 both cases, students from the last years of nursing education knew more of these trends than
36 those in the first years (Table 1). Only 21.1% of participants knew that the Fageström test is
37 not used to assess smokers' motivation to quit and 41.4% affirmed that hypnosis is not an
38 effective quitting method; students from the last years of schooling (3rd and 4th) were more
39 likely to know these concepts (aOR=1.18; 95%CI= 1.04-1.33) than first year students (Figure
40 1). In addition, 59.4% of participants knew that nicotine replacement therapy (NRT) is not
41 recommended to smokers who smoke less than five cigarettes per day, with students from
42 the last education years having greater odds of knowing this than those in the first years group
43 (aOR= 1.63; 95%CI= 1.43-1.85).
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Participants' attitudes towards tobacco control

While 63.1% of participants considered that health professionals should lead by the example and not smoke, only 45.1% thought that nursing students should have the same exemplary role. In both cases, never and former smokers were more likely to express higher support for these two statements than smokers (Table 2).

The majority of students (95.9%) believed that health professionals should be trained to help smokers quit, but only 56.3% believed that smokers are more likely to quit when advised by a health professional. 30.4% of participants thought that health professionals who smoke are less likely to advise their patients to quit, and compared to smokers, never smokers (aOR=1.51; 95%CI= 1.30-1.77) and former smokers (aOR=1.34; 95%CI= 1.07-1.68) were more likely to have this opinion (Figure 2). Finally, 69.4% of participants considered that the National Health System should fund effective treatments to quit smoking, with a lower support among former (aOR=0.78; 95%CI= 0.62-0.98) and never smokers (aOR=0.68; 95%CI= 0.58-0.79) compared to smokers (Figure 2).

Tobacco-related training received during nursing education

Most participants (80.0%) stated that they had been taught about the risks of smoking and the difference between active and passive smoking during their nursing education. However, less than half reported being informed about the reasons why people smoke; students from the last years had higher odds of having received this information (aOR= 3.89; 95%CI= 3.41-4.43). In addition, only 33.4% received training on how to help smokers quit, with the students from the last years having higher odds (aOR=7.86; 95%CI= 6.79-9.11) of receiving this training compared to those of the first years. In terms of how to support smokers quit, 60.5% were taught about the importance of giving educational materials, 65.3% about how to use NRT, and 30.9% about the use of other pharmacotherapies. This knowledge was higher among 3rd and 4th year students (see Table 3). Nevertheless, only 24.3% of participants affirmed to have the knowledge and skills required to help smokers quit. Students from the last years (3rd and 4th school years) were more likely (40.1%) to consider themselves capable

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3 of helping smokers to quit than students in the first years (1st and 2nd school years, 12.6%)
4 (OR= 4.69; 95%CI= 4.02-5.48) (Figure 3).
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10 **DISCUSSION**

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14 To our knowledge, this is the first study that comprehensively explores knowledge and
15 attitudes towards tobacco in a high number of nursing schools in Spain (all nursing schools
16 in Catalonia). A high percentage of nursing students knew about the risks of smoking; but
17 did not know about the current trends in the tobacco epidemic nor have the necessary
18 knowledge for assessing and treating tobacco dependence. Nursing students generally
19 reported having been informed about the risks of smoking, but only one in three reported
20 having been trained on how to help patients quit. These findings point out how tobacco-
21 related competencies are scarcely taught and evaluated in nursing programs in Catalonia.
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30 Our findings indicate that nursing students have a low attitude towards the role of nurses in
31 tobacco control, especially if they are smokers. In this study, participants' support towards
32 this role of nurses and nursing students was lower than that reported by other studies
33 (Vitzthum *et al.*, 2013; Chandrakumar and Adams, 2015; Sreeramareddy *et al.*, 2018). This
34 difference may derive from the inclusion of all University Nursing Schools in Catalonia,
35 yielding a more realistic picture of the situation than studies conducted in only one center.
36 Nurses' personal attitudes towards tobacco use influence their practices in advising and
37 counselling smokers to quit (Duaso *et al.*, 2017). It is known that college years are a critical
38 time for developing tobacco use and building attitudes towards tobacco (Ye *et al.*, 2017).
39 Thus, encouraging college students to quit during their university education (Pardavila-
40 Belio *et al.*, 2015) is essential, especially if they are pursuing a health professional degree
41 (Tavolacci *et al.*, 2018), as this may influence their future practice. Some undergraduate
42 students start tobacco use and become nicotine-dependent during their college years
43 (Freedman, Nelson and Feldman, 2012). It is critical to offer college students the
44 opportunity to quit, especially among nursing students who are at higher risk of becoming
45 smokers when compared to students from other healthcare professions (Tavolacci *et al.*,
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3 2018). Prior research in Spain has shown that a nurse-led intervention addressed to college
4 students was helpful in decreasing smoking rates (Martinez and Fernandez, 2015;
5 Pardavila-Belio *et al.*, 2015). Future research should be oriented to introduce smoking
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cessation programs among nursing students who smoke during school years.

The majority of participants knew about the harmful effects of smoking on health, which was similar to results reported by a study conducted in the UK (Richards and Borglin, 2011). However, participants were less informed about other tobacco-related contents, such as the current epidemiologic trends in tobacco use and information needed to assess and treat nicotine dependence. In this regard, although some studies have explored nursing students' knowledge in tobacco-related content, there is no consensus about what tobacco-related competencies nurses should acquire during their nursing education (Ye *et al.*, 2017). Ordás *et al.* explored nursing students' knowledge about tobacco and exposure to secondhand smoke as a cause of disease (Ordas *et al.*, 2015), but did not explore other contents. In our study, we have examined Spanish nursing students' knowledge, attitudes, and training in several tobacco-related topics, from epidemiologic trends to evidence-based interventions; however, more research is needed to establish what concepts and skills nurses should learn during their training.

Last, our participants confirmed that they had received little training in tobacco cessation interventions. This finding aligns with those of previous studies (Sarna *et al.*, 2009; Richards *et al.*, 2014; Sreeramareddy *et al.*, 2018). While our results show that students from the last years of schooling had received more training, there was a general lack of knowledge about how to assess and treat nicotine dependence. Up to now, smoking cessation is taught in broad courses such as health promotion (Richards *et al.*, 2014), and nursing programs tend to focus on the health effects of smoking but neglect the practical aspects of how to assist smokers to quit (Petersen *et al.*, 2017; Sreeramareddy *et al.*, 2018). In addition, cessation skills are rarely tested in student examinations (Richards *et al.*, 2014; Forman *et al.*, 2017). The limited number of hours allocated to smoking cessation in nursing curricula may also reflect the low priority of this topic among nurses (Freedman, Nelson and Feldman, 2012; Ye *et al.*, 2017). Training all healthcare workers to record smoking use and provide brief smoking cessation intervention may be an effective method to scaling up the use of smoking cessation guidelines

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3 (Carson *et al.*, 2012) and counteract the tobacco epidemic. However, this material is usually
4 only given in postgraduate short courses (Ye *et al.*, 2017), ranging from 1 to 4 hours, and that
5 cover several tobacco-related specific topics such as tobacco dependence, secondhand
6 tobacco smoke, nicotine withdrawal symptoms, and tobacco cessation interventions
7 (including motivational approaches, stages of change, etc.) (Ye *et al.*, 2017). Efforts to
8 include tobacco cessation in Nursing Schools curricula have been made in the USA (Petersen
9 *et al.*, 2017); however, there is not a consensus of what material should this curricula
10 incorporate nor which competencies students should demonstrate at the end of their
11 bachelor's degree (Royal College of Physicians, 2018). In a study conducted in Canada, the
12 majority of nursing teachers and professors lack specific smoking cessation training and
13 background, and consequently their lectures include little content about this topic (Lepage,
14 Dumas and Saint-Pierre, 2015). In Spain, nursing curriculum guidelines state a commitment
15 to health promotion, but there are not current guidelines on teaching smoking cessation
16 (Ordas *et al.*, 2015).
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27 28 *Strengths and Limitations*

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30 Due to the use of a cross-sectional design, we can report associations only, without the
31 possibility of inferring causality. Nevertheless, this cross-sectional study is the baseline of a
32 future cohort that will allow us to investigate tobacco-related knowledge, attitudes and
33 behaviors among nursing students. In addition, some selection bias can be introduced due to
34 only those students who attended the class in which we conducted the survey were invited to
35 participate. However, participation from those that were at class accounted for 98.5% and we
36 were able to survey 60% of all nursing students in Catalonia in 2015-2016. Moreover, this
37 this study has other strengths, including that the questionnaire employed is based on the
38 Global Health Professional Survey (GHPS) (Warren *et al.*, 2011) and its big sample size,
39 allowing the clustering and multilevel analysis models.
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Conclusions

Nursing students lack sufficient knowledge about tobacco epidemic current and how to assess and treat tobacco dependence. This is mainly because they receive scarce training in these areas during their school years. In addition, nursing students show a low attitude towards their role in tobacco control, especially among smokers. These findings point out the need to strengthen tobacco-related education by incorporating more tobacco-related content in nursing curricula in an effort to boost the future contribution of nurses to tobacco control. There is a need to further investigate the most effective approaches to introducing tobacco-related content into overall education and specifically in mental health nursing education.

Figures:

Figure 1: Sociodemographic factors associated with knowledge acquired about several tobacco-related issues (aOR and 95% CI)

Figure 2: Sociodemographic factors associated with participants' attitudes towards health professionals' and health organizations' role in tobacco control (aOR and 95% CI)

Figure 3: Figure 3. Sociodemographic factors associated self-reported training received on tobacco-related contents during their Nursing Bachelor's degree Program (aOR and 95% CI)

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For Review Only

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2 **Table 1. Knowledge acquired about tobacco-related content (epidemiology, cessation, etc) by sex, school years and smoking status**

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Statements	Overall		Sex				School years				Smoking status					
			Men		Women		1+2		3+4		Smoker		Former		Never	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Tobacco use is an addiction	4,252	98.0	691	98.0	3,594	98.0	2,406	97.8	1,732	98.3	1,255	97.4	551	97.2	2,446	98.5
The prevalence of tobacco use is decreasing in the last years in Spain	1,552	35.8	277	39.3	1,286	35.1	833	33.9	688	39.0	469	36.4	226	39.9	857	34.5
Tobacco-related mortality is decreasing in the last years in Spain	3,361	77.5	524	74.3	2,865	78.1	1,858	75.5	1,413	80.2	973	75.5	447	78.8	1,941	78.1
Cardiovascular diseases are the main cause of tobacco-related morbidity in Spain	2,883	66.4	487	69.1	2,417	65.9	1,514	61.5	1,290	73.2	931	72.3	413	72.8	1,539	62.0
Secondhand smoke is a hazard for non-smokers	4,267	98.3	687	97.4	3,614	98.5	2,419	98.3	1,735	98.5	1,262	98.0	556	98.1	2,449	98.6
Among pregnant women who smoke, it should be recommended to smoke a maximum of five cigarettes per day when they have anxiety	2,883	66.4	507	71.9	2,394	65.3	1,667	67.8	1,136	64.5	753	58.5	347	61.2	1,783	71.8
Pageström test does not assess smokers' motivation to quit	917	21.1	155	22.0	766	20.9	547	22.2	346	19.6	272	21.1	124	21.9	521	21.0
Hypnosis has not been proved to be effective quit smoking	1,796	41.4	302	42.8	1,509	41.1	985	40.0	770	43.7	506	39.3	218	38.4	1,072	43.2
Smoking during pregnancy increases the risk of sudden infant death	3,739	86.2	593	84.1	3,177	86.6	2,077	84.4	1,574	89.3	1,091	84.7	482	85.0	2,166	87.2
Passive smoking causes lung cancer in non-smokers	3,284	75.7	577	81.8	2,729	74.4	1,778	72.3	1,411	80.1	972	75.5	448	79.0	1,864	75.0
Guidelines do not recommend NRT to smokers of less than five cigarettes a day	2,577	59.4	389	55.2	2,200	60.0	1,349	54.8	1,163	66.0	740	57.5	337	59.4	1,500	60.4

All the statements of this table are true, and frequencies and percentages correspond to participants who answered correctly to the true/false questions

NRT= Nicotine Replacement Therapy

Table 2. Participants' attitudes towards health professionals' and health organizations' role in tobacco control by sex, school years and smoking status

Attitudes	Overall		Sex				School years				Smoking status					
			Men		Women		1+2		3+4		Smoker		Former		Never	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Health professionals should be an example and not smoke	2,727	63.1	432	61.9	2,321	63.4	1,576	64.3	1,089	61.9	585	45.7	364	64.2	1,778	71.7
Nursing students should be an example and not smoke	1,951	45.1	307	44.0	1,661	45.4	1,102	45.0	811	46.2	365	28.4	272	48.0	1,314	53.2
Health professionals should be trained to help patients quit smoking	4,121	95.9	652	93.5	3,497	96.2	2,316	95.1	1,692	96.7	1,193	93.7	539	95.4	2,389	97.1
Health professionals should routinely ask and record tobacco use of their patients in the medical record	3,608	83.5	572	82.2	3,062	83.7	1,995	81.4	1,519	86.7	1,004	78.4	483	85.3	2,121	85.8
Health professionals should routinely advice their smoker patients to quit smoking	3,458	80.3	549	78.7	2,939	80.6	1,957	80.0	1,406	80.3	971	75.9	468	83.0	2,019	81.9
The possibilities that a smoker quits increase when advised by a health professional	2,427	56.3	442	63.5	2,001	54.8	1,294	52.9	1,056	60.3	704	55.2	326	57.7	1,397	56.5
A health professional who smoke is less likely to advise their patients to quit	1,313	30.4	224	32.1	1,096	30.0	721	29.5	549	31.3	314	24.6	172	30.6	827	33.4
The National Health System should fund effective treatments to quit smoking	2,996	69.4	476	68.4	2,545	69.7	1,682	68.8	1,241	70.8	953	74.6	392	69.6	1,651	66.7

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2 **Table 3. Participants' self-reported training received on tobacco-related contents during their Nursing Bachelor Degree Program by sex,**
 3 **school years and smoking status**

4	5 Overall		6 Sex				7 School years				8 Smoking status					
			9 Men		10 Women		11 1+2		12 3+4		13 Smoker		14 Former		15 Never	
	16 n	17 %	18 n	19 %	20 n	21 %	22 n	23 %	24 n	25 %	26 n	27 %	28 n	29 %	30 n	31 %
32	33 Training received															
34	35 Has somebody informed															
36	37 you about the risks of															
38	39 smoking in class, during a															
40	41 seminar or practicum															
42	43 session/class?															
44	3,563	82.5	586	83.5	3,007	82.4	1,800	73.6	1,665	94.8	1,040	81.4	472	84.0	2,051	82.8
45	46 Does somebody has															
47	48 explained you the															
49	50 difference between an															
51	51 active smoker and a															
52	52 passive smoker in class?															
53	3,762	86.9	622	88.4	3,173	86.7	1,979	80.6	1,684	95.8	1,134	88.5	492	87.1	2,136	86.1
54	55 Have you discussed the															
56	56 reasons why people															
57	57 smoke?															
58	2,114	49.1	375	53.6	1,756	48.2	867	35.5	1,185	67.7	600	46.9	283	50.8	1,231	49.8
59	60 Have you been taught															
61	61 about the importance of															
62	62 asking and recording															
63	63 tobacco use in the health															
64	64 record?															
65	2,821	65.3	434	61.8	2,405	65.9	1,286	52.6	1,452	82.7	821	64.1	390	69.1	1,610	65.1
66	67 Have you been trained on															
67	68 how to help smokers to															
68	69 quit?															
69	1,440	33.4	237	33.8	1,217	33.3	373	15.2	1,022	58.3	426	33.3	201	35.7	813	32.9
70	71 Have you been															
71	72 recommended to provide															
72	73 educational material to															
73	74 smokers in order to advise															
74	75 them about the benefits															
75	76 of quitting?															
76	2,605	60.5	415	59.3	2,217	60.9	1,121	45.9	1,416	80.8	761	59.6	346	61.3	1,498	60.7
77	78 Have you been taught on															
78	79 how to use NRT for															
79	80 helping smokers to quit?															
80	2,808	65.3	468	66.9	2,363	65.0	1,377	56.4	1,358	77.7	831	65.3	400	71.0	1,577	63.9
81	82 Have you been taught on															
82	83 to use pharmacological															
83	84 treatments to quit															
84	85 smoking besides NRT?															
85	1,322	30.9	235	33.8	1,099	30.4	609	25.0	668	38.6	463	36.4	181	32.6	678	27.6
86	86 At present I have															
87	87 knowledge and enough															
88	88 skills to help a smoker to															
89	89 quit															
90	1,044	24.3	221	31.9	832	22.9	306	12.6	698	40.1	329	25.9	168	30.2	547	22.2

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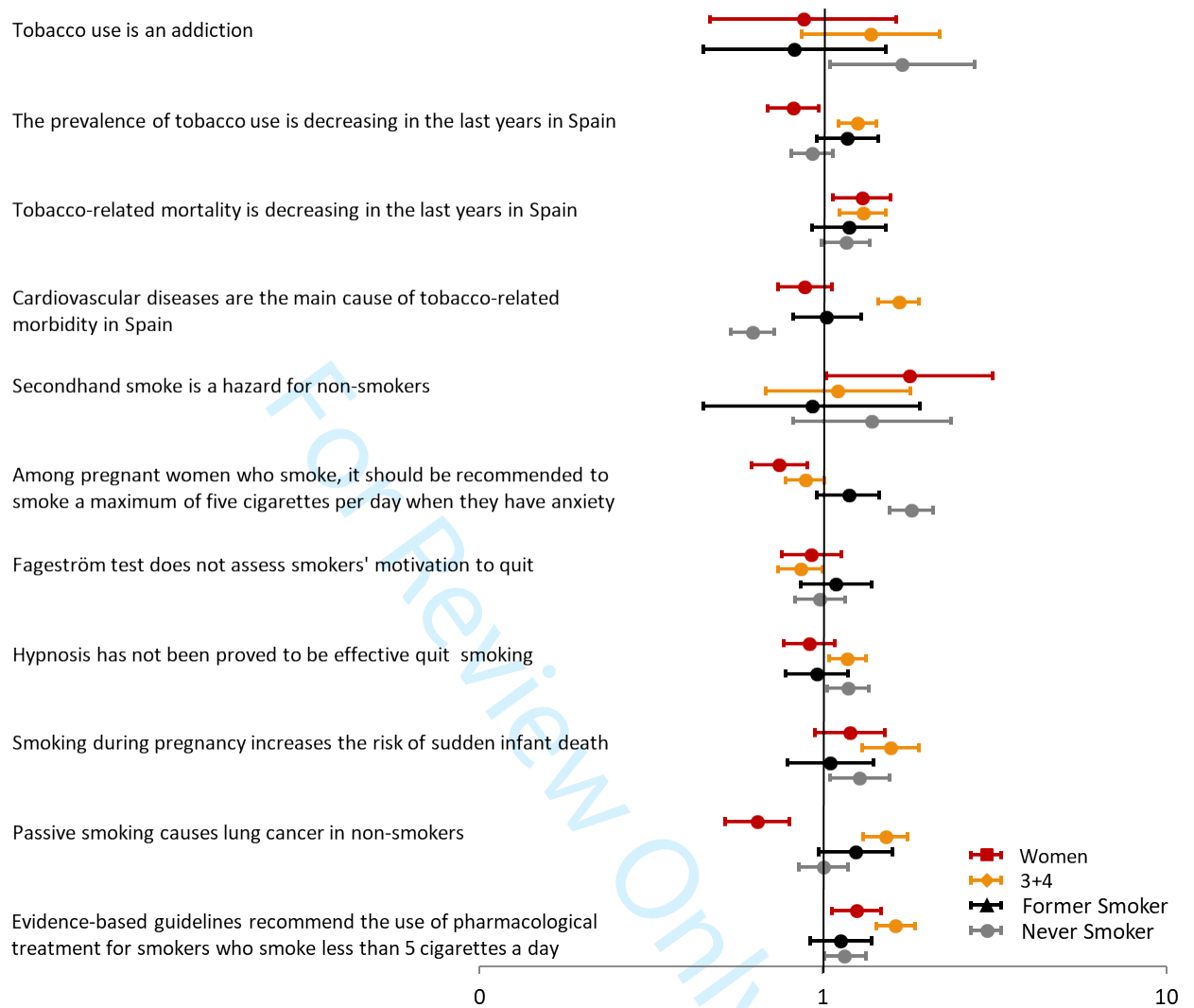
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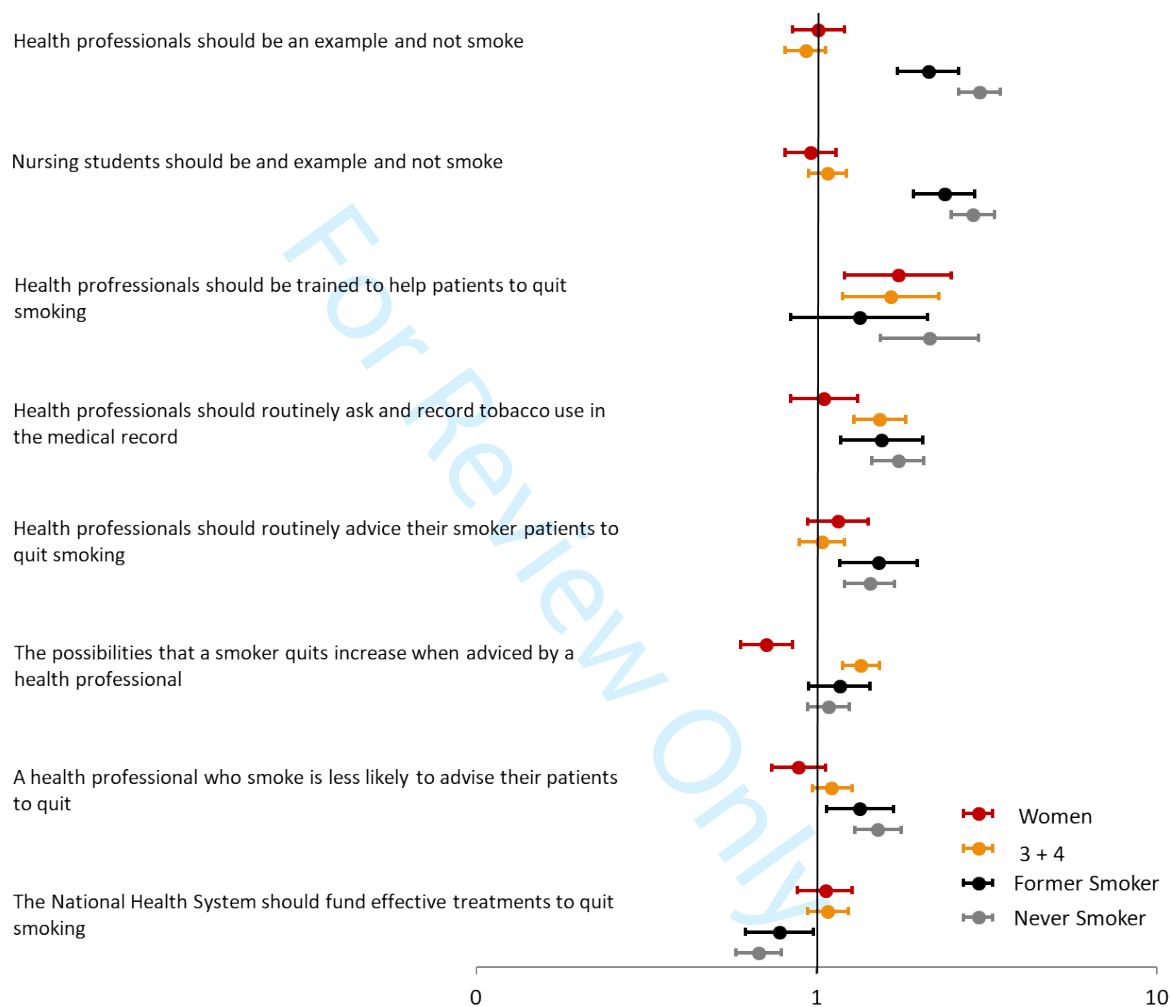
Figure 1. Sociodemographic factors associated with knowledge acquired about several tobacco-related issues (aOR and 95% CI)



Note: Multi-level models are adjusted by sex, year of school and smoking status

References categories (Women- Ref= Men); (3+4 years – Ref= 1+2 years); (Former Smoker- Ref= Smoker); (Never Smoker- Ref= Smoker)

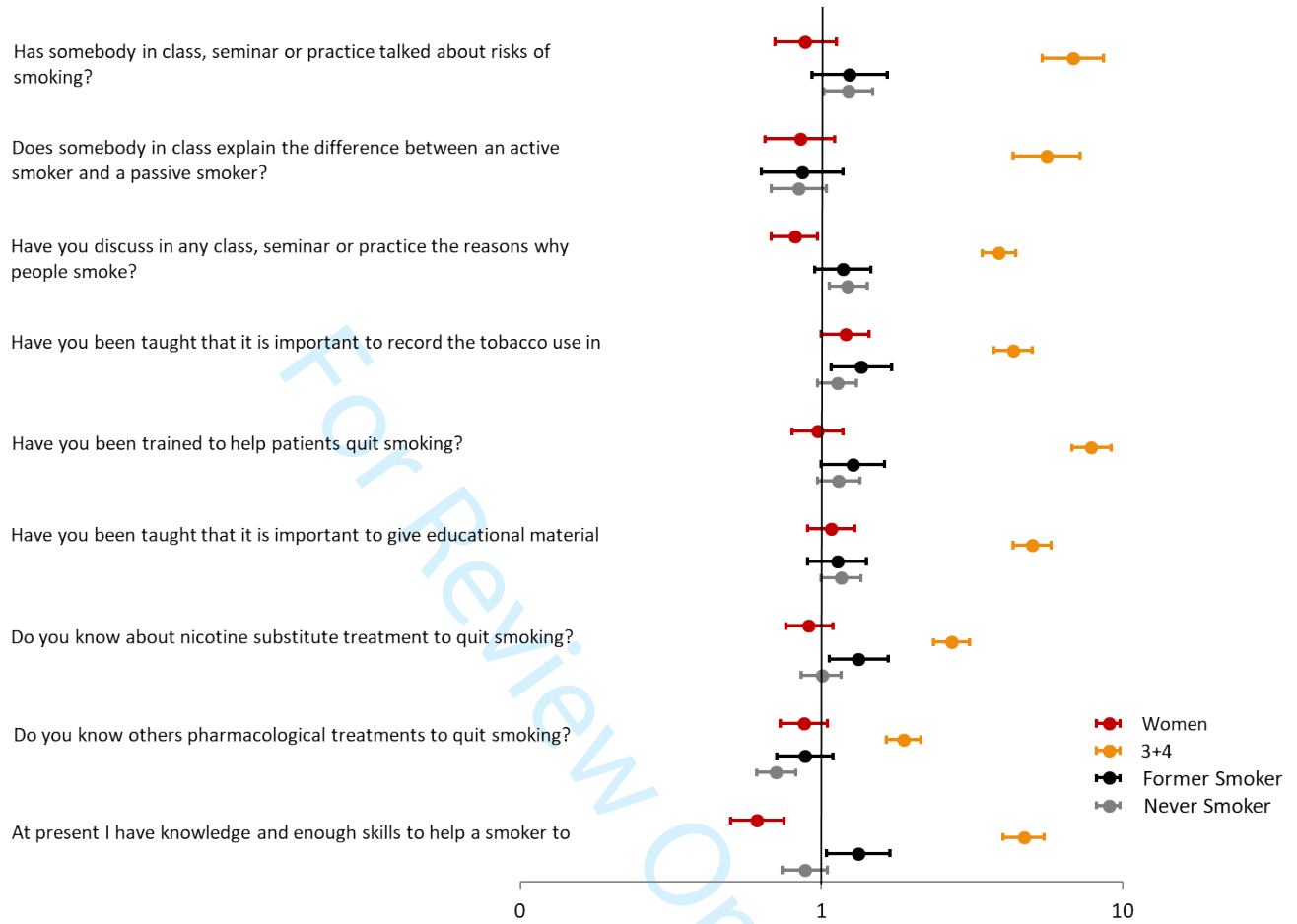
Figure 2. Sociodemographic factors associated with participants' attitudes towards health professionals' and health organizations' role in tobacco control (aOR and 95% CI)



Note: Multi-level models are adjusted by sex, year of school and smoking status

References categories (Women- Ref= Men); (3+4 years – Ref= 1+2 years); (Former Smoker- Ref= Smoker); (Never Smoker- Ref= Smoker)

Figure 3. Sociodemographic factors associated self-reported training received on tobacco-related contents during their Nursing Bachelor’s degree Program (aOR and 95% CI)



Note: Multi-level models are adjusted by sex, year of school and smoking status

References categories (Women- Ref= Men); (3+4 years – Ref= 1+2 years); (Former Smoker- Ref= Smoker); (Never Smoker- Ref= Smoker)